Translation of Disease Markers into Bioluminescent Signals

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Biomolecular Systems Research Program

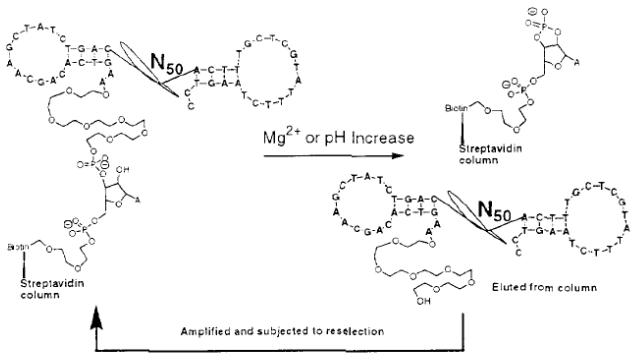


Figure 3: Principle of selection by catalytic elution for the release of small molecules: Random library with 50 randomized bases (N50) and two primers: 5'-primer is biotinylated and contains the most labile phosphodiester bond separated from other based through polyethylene glycol linker; Permissive elution is achieved by increasing the concentration of divalent cations or increasing the pH toward physiological levels.

Description

Specific Aims

AIM 1. Selcction of oligonuclcotides that self-cleave upon of complexation with thrombin in vitro.

AIM 2: Construction of oligonucleotides that release luciferin upon complexation with thrombin in vitro and in vivo.

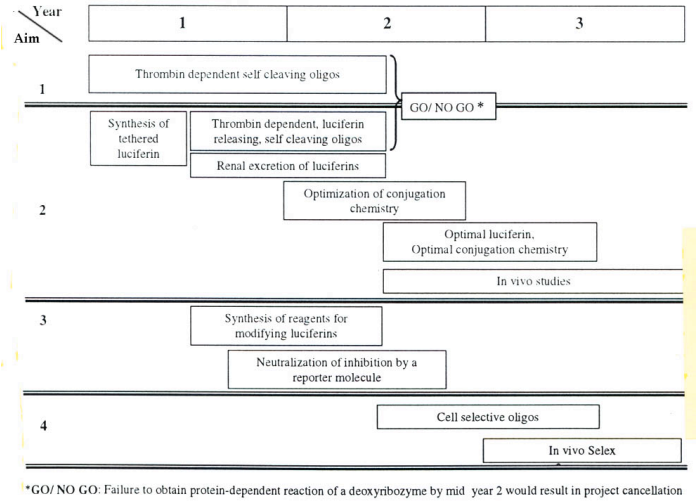
AIM 3: Neutralization-of-inhibition assays with light-emitting enzymes.

AIM 4: Identification of cell-selective oligonucleotides.

Innovative Claims/NASA Significance

We propose to detect in yivo the earliest molecular signatures of disease by translating individual molecular markers into reporter molecules that are read-out in urine. Thc "translation" occurs through an autocatalytic complex formed between the disease marker and the recognition elcment of an oligonucleotide-reporter molecule conjugate. Upon complex formation, sex-cleavage releases the reporter molecule for renal excretion.

Plans



*GO/ NO GO: Failure to obtain protein-dependent reaction of a deoxyribozyme by mid year 2 would result in project cancellation